

# Work Order ID 65739



Page 1

Tuesday, January 25, 2011 10:19:30 AM

Item ID: D204-635-041

Accept



Setup Start



Revision ID:

Stop



Item Name: Replacement Skidtube

Start Date: 1/24/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 1/31/2011 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals:

Process Plan:

*PL*

Date: 1-01-25

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

Draw Nbr

Revision Nbr

D2590

RevD DEO-D1

100

0.00



DC

Document Control

Memo

0.00

Photocopy bluefile & type labels per PPP D204-635-041  
CHG 003

*Subs 173*

365739

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
11.03.17	150	Acceptable to use 0.049" WALL CROSS BOLT SPACERS THAT ARE OTHERWISE <del>MADE TO</del> MADE TO D4202 Rev. A	BE	11/03/15		11.03.17 DS/042	S- 11/03/17

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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NOTE: Date & initial all entries

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Page 2

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Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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110

0.00



Skidtubes

Memo

0.00

Skidtubes

1- Inspect mat'l D2500-1-190 for damage

2-Cut D2500-1-190 per Dwg D2590 .Deburr ends

3-Drill pilot holes using drill jig DT 8149 & DT8711-1&-2 and open to finish size as per dwg

4-Deburr holes as per QSI002 section 4.2.3 and blow out all chips from inside of tube

5-Acid etch and Alodine tube per QSI 005 4.1

6-Bond web in place per QSI 015. Allow 12 Hrs. cure time before cutting Pick:

Qty ☐ Part Number ☐ Description ☐ Batch  
A/R ☐ ☐ Sikaflex-291 ☐ 116080 ☐

Sikaflex expire date: 11/09/10

Start Time: 4:00 11/02/09

Fin Time: 7AM 11-2-24

BE 11/02/08

BE 11/02/08

BE 11/02/02

B 11/02/09

W/O:		WORK ORDER CHANGES					
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Page 3

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Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120 	CNC Bend 1	0.00							
	Memo Bend as per program D2590.C on CNC Bender	0.00							
			DP	11-2-24					
130 	Skidtubes	0.00							
	Memo 1-Cut tubes as per Dwg. D2590. 2-Deburr ends after cutting.	0.00							
			DP	71-3-8					
				DP	11-2-24				
140 	QC6- Inspect dimensions to drawing	0.00							
	Memo Quality Control	0.00							
						x1			

W/O:		WORK ORDER CHANGES					
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Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Page 4

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Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

150

0.00



Skidtubes

Skidtubes

Memo

0.00

1-Prepare tube for welding D2576-3 Step Remove alodine as required.

BE 11/03/15

2-Weld step D2576 as per Dwg. D2590 and QSI 004

A/R□□□ Aluminum Rod

M116577

BE 11/03/15

3-Grind weld flush on step

BE 11/03/15

4-Insert D4202-1 spacer, swage as per QSI002 and trim/ grind flush per QSI002 and as per dwg

BE 11/03/15

5-Drill holes for wearplates using DT 8218 & DT8937 Open holes to 19/64", adjust stopper not to hit web. Debur

6-Drill pilot holes for aft cap using DT 8215 Open holes to #6 Drill bit. Debur

BE 11/03/15

7-Drill pilot holes for Tow ring using DT9425, open to .640" and Debur  
\*\*\*\*verified dim. before drilling\*\*\*\*

160

QC10- Inspect visual per QSI004- ground welds

0.00



QC

Memo

0.00

Quality Control

Sub 1/22

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Page 5

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Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

170

QC6- Inspect dimensions to drawing

0.00



QC

Memo

0.00

Quality Control

S u / 03 / 12 11.03.12

175

Pressure Wash per QSI005 4.3

0.00



HandFinish

Memo

0.00

Hand Finishing

(IX) m-l 11/03/23

180

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

0.00



Powdercoat

Memo

0.00

Powder Coating

START TIME:

OVEN TEMPERATURE:

FINISH TIME:

11:10:  
350°  
11:40.

1 BL 11-3-23

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Tuesday, January 25, 2011 10:19:30 AM



Page 6

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Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

190

QC3- Inspect Part Finish

0.00

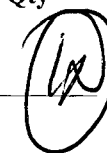


QC

Memo

0.00

m-l 11/03/28



Quality Control

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Page 7

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Item Name: Replacement Skidtube

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Start Date: 1/24/2011 Start Qty: 1.00



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Required Date: 1/31/2011 Req'd Qty: 1.00



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Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

200

0.00



HandFinish

Hand Finishing

Memo .

0.00

1-Install inserts & wearplates & gaskets using a drop of Sikaflex on insert holes before installing wearplates

A/R ☐ ☐ ☐ Sikaflex-291 ☐ M116040

Sikaflex expire date: 11/09

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2590 and seal Fwd Step & Aft Cap with Sikaflex. Clean excess adhesive

A/R ☐ ☐ ☐ Sikaflex-291 ☐ M116040

Sikaflex expire date: 11/09

5-Wing Walk as per Dwg D2590 and QSI 005

4.4

Batch: M116402



m 11/03/28

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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**Work Order ID 65739**

Tuesday, January 25, 2011 10:19:30 AM

Page 8

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Revision ID:

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Start Date: 1/24/2011 Start Qty: 1.00

Required Date: 1/31/2011 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

210

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

215

Identify as per dwg & Stock Location: RG72 0.00

Packaging

Memo

0.00

Packaging

220

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

40

11/03/29

11/03/29

MF  
11-08-29

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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# Picklist Print

Tuesday, January 25, 2011 10:19:36 AM

Page 1

Work Order ID: 65739

Parent Item: D204-635-041

Parent Item Name: Replacement Skidtube



Start Date: 1/24/2011

Required Date: 1/31/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:F 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30 KJ  
 IPP Rev:G 07-07-09 Added SS Wearplates & Gaskets JLM IPP RevH:  
 add identify and stock seq DD 10.01.28 verf:EC  
 IPP Rev:I 10.12.01 as per DEO DD  
 verf:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	-------------	--------------	---------------	----------------	--------

D4202-1		Manufactured	No			150	Each	106.0000	17	17			
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Spacer

Location

Loc Qty

Loc Code

LG

106

64608

106

ALS7-1032-130		Purchased	No			180	Each	1,628.000	44	44			
---------------	--	-----------	----	--	--	-----	------	-----------	----	----	--	--	--



Insert

Location

Loc Qty

Loc Code

FP

689

115079

689

ST282

939

113238

17

115502

500

115581

422

AN3-5A		Purchased	No			180	Each	1,079.000	2	2			
--------	--	-----------	----	--	--	-----	------	-----------	---	---	--	--	--



Bolt

Location

Loc Qty

Loc Code

ST350

1079

115016 ✓

379

115371

500

116632

200

BE 11/03/15  
 B67308 x17

m-l 11/03/28

44X

m-l 11/03/28

2X

\*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

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Page 2

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Parent Item: D204-635-041

Parent Item Name: Replacement Skidtube

Start Date: 1/24/2011

Required Date: 1/31/2011

Start Qty: 1.00

Required Qty: 1.00

AN3C4A Purchased No 180 Each 1,172.000 44



BOLT

Location

Loc Qty

Loc Code

ST350

1172

115300

25

116075

947

116590

200

M 116924

m-k 11/03/28

44X

X

AN960C10L NAS1149C0332 Purchased No 180 Each 25.0000 44

R



washer

Location

Loc Qty

Loc Code

ST245

25

107534

25

M 116304

m-k 11/03/28

44X

AN960JD10L NAS1149D0332J Purchased No 180 Each 0.0000 2



Washer

M 117010

2x m-k 11/03/28

D2594-1 Manufactured No 180 Each 235.0000 10



Plug, 205 Skidtube

Location

Loc Qty

Loc Code

FP

183

42807

112

55002

71

FP14

52

58434

15

62893

37

66932

m-k 11/03/28

10X

Tuesday, January 25, 2011 10:19:37 AM

Shop Packet Print

Page 2

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Tuesday, January 25, 2011 10:19:37 AM

Page 3

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Parent Item Name: Replacement Skidtube

Start Date: 1/24/2011

Required Date: 1/31/2011

Start Qty: 1.00

Required Qty: 1.00

D2594-3  
O-Ring, 205 Skidtube

Manufactured No 180 Each 739.0000 10 10

Location	Loc Qty	Loc Code
FP	43	65518
55546	19	
58191	12	
59358	12	
fpa	696	
61762	696	

m-l 11/03/28

D2855  
Cap

Manufactured No 180 Each 54.0000 1 1

Location	Loc Qty	Loc Code
FP6	3	
56613	1	
63634	2	
ST026	51	
50513	1	
50770	28	
51539	2	
53791	20	

m-l 11/03/28

D3564-11  
Wearshoe

Manufactured No 180 Each 7.0000 1 1

Location	Loc Qty	Loc Code
FP019	7	
62236	7	

m-l 11/03/28

66154

IX

Tuesday, January 25, 2011 10:19:37 AM

Shop Packet Print

Page 3

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Page 4

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Start Date: 1/24/2011

Required Date: 1/31/2011

Start Qty: 1.00

Required Qty: 1.00

D3564-13

Manufactured No

180

Each

15.0000

1

1



Wearshoe

Location

Loc Qty

Loc Code

FP17

15

59660

1

61828

2

62229

12

66805

m-l 11/03/28

IX

D3564-7

Manufactured No

180

Each

25.0000

1

1



Wearshoe

Location

Loc Qty

Loc Code

FP

25

33803

4

43229

15

46492

6

66153

m-l 11/03/28

IX

D3564-9

Manufactured No

180

Each

16.0000

1

1



Wearshoe

Location

Loc Qty

Loc Code

FP

1

55334

1

FP19

15

62238

15

67496

m-l 11/03/28

IX

D3566-1

Manufactured No

180

Each

4.0000

2

2



Gasket

Location

Loc Qty

Loc Code

FP015

4

57715

1

63573

3

m-l 11/03/28

2X

Tuesday, January 25, 2011 10:19:38 AM

Shop Packet Print

Page 4

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



# Picklist Print

Tuesday, January 25, 2011 10:19:38 AM

Page 5

Work Order ID: 65739

Parent Item: D204-635-041

Parent Item Name: Replacement Skidtube

Start Date: 1/24/2011

Required Date: 1/31/2011

Start Qty: 1.00

Required Qty: 1.00

D3566-13

Manufactured No

180 Each

25.0000

1

1



Gasket

Location

Loc Qty

Loc Code

FP012

5

61996

5

FP014

20

64070

20

66550

m-l 11/03/28

IX

D3566-7

Manufactured No

180 Each

25.0000

1

1



Gasket

Location

Loc Qty

Loc Code

FP

25

37354 ✓

6

55490

19

IX

D2500-1-190

Manufactured No

110 Each

78.0000

1

1



Ext'n - 'I' Beam Tube 4"

Location

Loc Qty

Loc Code

LG

78

52319

7

58427

71

I

D2597

Manufactured No

110 Each

0.0000

1

1



204 Web

B66297.

1 B 11/02/09.

Tuesday, January 25, 2011 10:19:38 AM

Shop Packet Print

Page 5

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

# Picklist Print

Tuesday, January 25, 2011 10:19:38 AM

Page 6

Work Order ID: 65739



Parent Item: D204-635-041



Parent Item Name: Replacement Skidtube

Start Date: 1/24/2011

Required Date: 1/31/2011

Start Qty: 1.00

Required Qty: 1.00

D2576-3

Manufactured No

150

Each

62.0000

1

1



Step (maching detail)



BE 1/31/15

Location

Loc Qty

Loc Code

LG

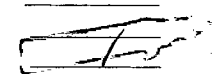
62

46661

14

52215

48



Tuesday, January 25, 2011 10:19:38 AM

Shop Packet Print

Page 6

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

**DART**

DESIGN <i>H</i>	DRAWN BY <i>PH</i>	<b>DART AEROSPACE LTD</b> HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>H</i>	APPROVED <i>H</i>	DRAWING NO. D2590	REV. D SHEET 1 OF 2
DATE 07.04.05		TITLE 204 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.28	REDRAWN, INCLUDED DEO 9094/9097	
D	07.04.05	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124	

**RELEASED**  
07.06.28 *H***DEO ATTACHED**

QTY -041	Part Number	Description
X	D2590-041	SKIDTUBE ASSEMBLY
1	D2500-1-190	EXTRUSION
1	D2576-3	STEP
17	D2579	CROSS BOLT SPACER
10	D2594-1	PLUG
10	D2594-3	O-RING
1	D2597	204 WEB
1	D2855	AFT CAP
1	D3564-7	WEARSHOE
1	D3564-9	WEARSHOE
1	D3564-11	WEARSHOE
1	D3564-13	WEARSHOE
2	D3566-1	GASKET
1	D3566-7	GASKET
1	D3566-13	GASKET
44	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
44	AN3C4A	BOLT
2	AN3-5A	BOLT
44	AN960C10L	WASHER
2	AN960JD10L	WASHER

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 45739  
*PS 11-01-25*

**GENERAL NOTES:**

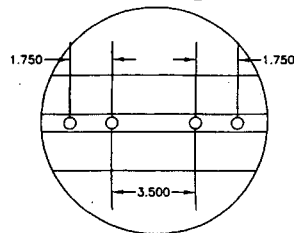
- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) INSERT D2597 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-204 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (44 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND AN960C10L WASHERS WITH SIKAFLEX-241/-291.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:  
ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB  
POWDER COAT ASSEMBLY GLOSS WHITE (REF 4.3.5.1) PER DART QSI 005 4.3  
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

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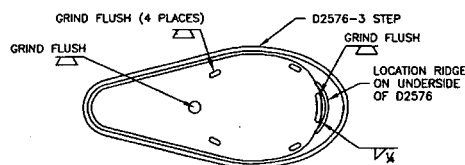


**DETAIL A**  
SCALE 5:24

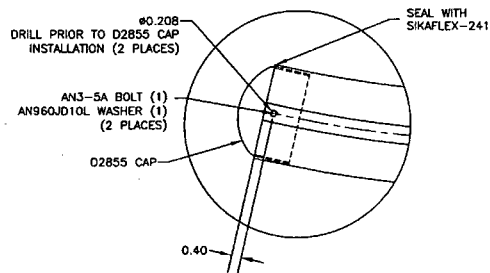


**RELEASED**  
07.06.28  
**DEO ATTACHED**

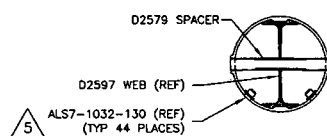
**DETAIL B**  
SCALE 5:24



**DETAIL C**  
SCALE 5:24

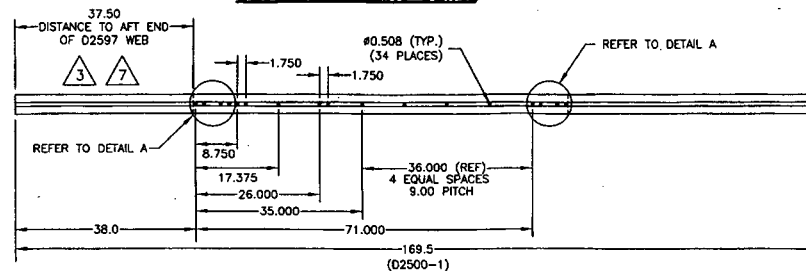


**SECTION D-D**  
SCALE 5:24

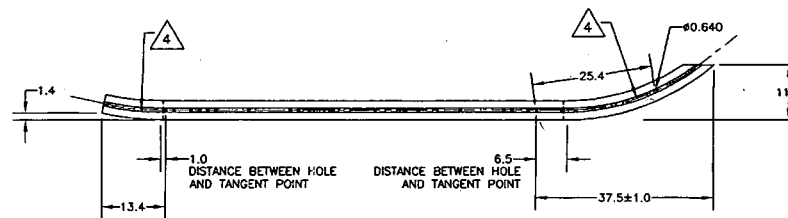


AFTER DRILLING AND BENDING ASSEMBLY  
PERFORM THE FOLLOWING FOR #0.508 HOLES ONLY:  
1. CHAMFER HOLE 0.050 X 45°  
2. INSERT D2579 SPACER (17 PLACES)  
3. WELD INTO PLACE AND GRIND FLUSH  
4. C-BORE D2579 SPACER TO #0.437 X 1.00 DEEP

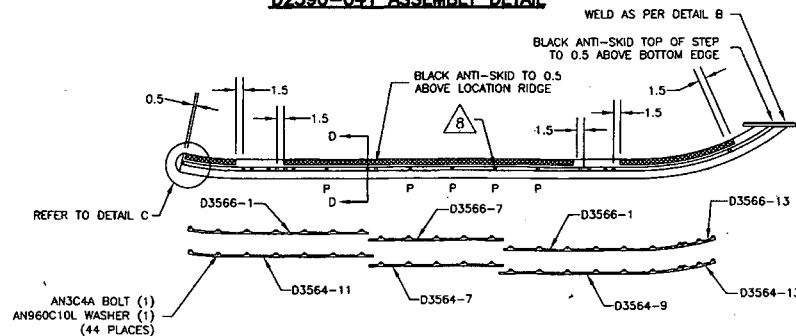
**D2590-1 DRILLING DETAIL**



**D2590-1 BENDING AND CUTTING DETAIL**



**D2590-041 ASSEMBLY DETAIL**



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DATE		07.04.05	DRAWING NO.	D2590	REV. D
TITLE		204 SKIDTUBE ASSEMBLY	SHEET 2 OF 2		SCALE
			1:24		

DRAWING NO. D2590	TITLE 204 SKIDTUBE ASSEMBLY	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D2590-D-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>UP</i>	CHECKED <i>L</i>	MFG. APPR. <i>B</i>	APPROVED <i>MP</i>		DE APPR. <i>#</i>		
DATE 10.09.22	DATE 10.11.04	DATE 10.11.04	DATE 10/11/04		DATE 10.11.04		

**PURPOSE:**

CHANGE ALL WELDED CROSSBOLT SPACERS TO SWAGED SPACERS

**CHANGE:**

PARTS LIST IS AMENDED AS FOLLOWS:

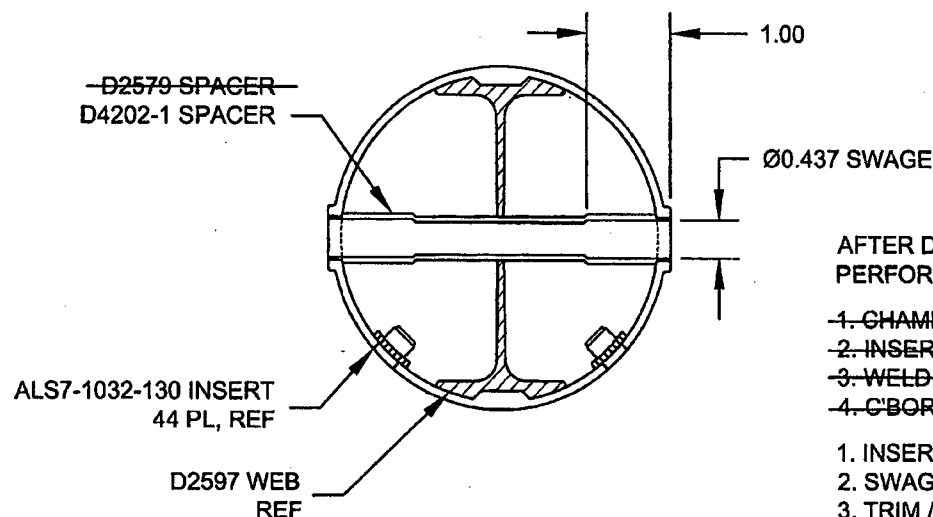
WAS

QTY	PART NUMBER	DESCRIPTION
-041		
17	D2579	CROSS BOLT SPACER

IS

17	D4202-1	SPACER
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SECTION D-D IS AMENDED AS FOLLOWS:



AFTER DRILLING AND BENDING ASSEMBLY  
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:

1. CHAMFER HOLE 0.050 X 45°
2. INSERT D2579 SPACER (17 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C'BORE D2579 SPACER TO Ø0.437 X 1.00 DEEP
5. INSERT D4202-1 SPACER, 17 PL
6. SWAGE TO Ø0.437 X 1.00 DEEP PER QSI 002
7. TRIM / GRIND FLUSH PER QSI 002

**SECTION D-D**  
NOT TO SCALE

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**RELEASED**  
2010-11-17  
*MP*

*w/o 65739*





## Chris Provencal

---

**From:** David Shepherd <dshepherd@dartaero.com>  
**Sent:** March 16, 2011 6:21 PM  
**To:** 'Chris Provencal'  
**Cc:** 'Mike Petsche'; 'Linda Lacelle'; 'Bill Beckett'  
**Subject:** RE: 0.049 Wall Xbolt Spacers

Chris,

The substitution is acceptable. However, I would still like to see that this is repeatable. Per my earlier suggestion, I assume production is building a couple of tubes with 0.049 wall crossbolt spacers to verify that there is no cracking after several swagings???

David

---

**From:** Chris Provencal [mailto:cprovencal@dartaero.com]  
**Sent:** Wednesday, March 16, 2011 9:14 AM  
**To:** David Shepherd  
**Cc:** Mike Petsche  
**Subject:** 0.049 Wall Xbolt Spacers

David,

To approve the re-worked xbolt spacers, I'd need to attach an email from you giving OK to substitute the 0.058" wall crossbolt spacers with 0.049" wall crossbolt spacers. The crossbolt spacers are otherwise made to D4202 Rev. A.

The justification would be the initial testing, as recorded in the original design review, which showed that 0.049" wall xbolt spacers were stronger than welded/c-bored crossbolt spacers. These findings were confirmed when we tested another batch of swaged vs welded samples yesterday (March 15<sup>th</sup>, 2011).

Chris

**Work Order ID 65739**

Tuesday, January 25, 2011 10:19:30 AM



Page 1

Item ID: D204-635-041

Accept



Setup Start



Revision ID:

Item Name: Replacement Skidtube

Stop



Start Date: 1/24/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 1/31/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

*PL*

Date: 1-01-25 Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr

Revision Nbr

D2590

RevD DEO-D1

100

0.00



DC

Document Control

Memo

0.00

Photocopy bluefile & type labels per PPP D204-635-041  
CHG 003